NOAA FISHERIES

NW Fisheries Science Center

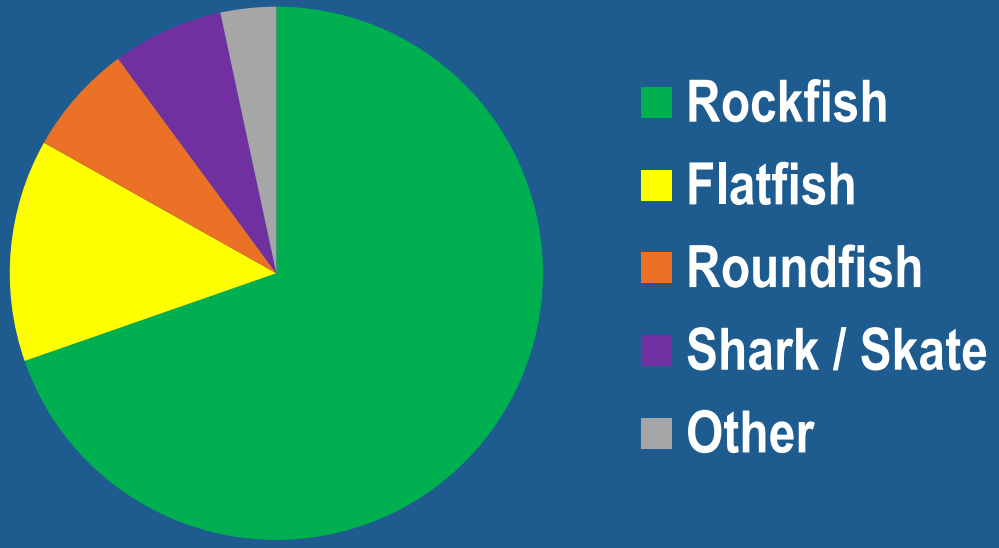
Measuring Performance Against National Mandates and Standards: Accomplishments

Mandates & Measures of Performance

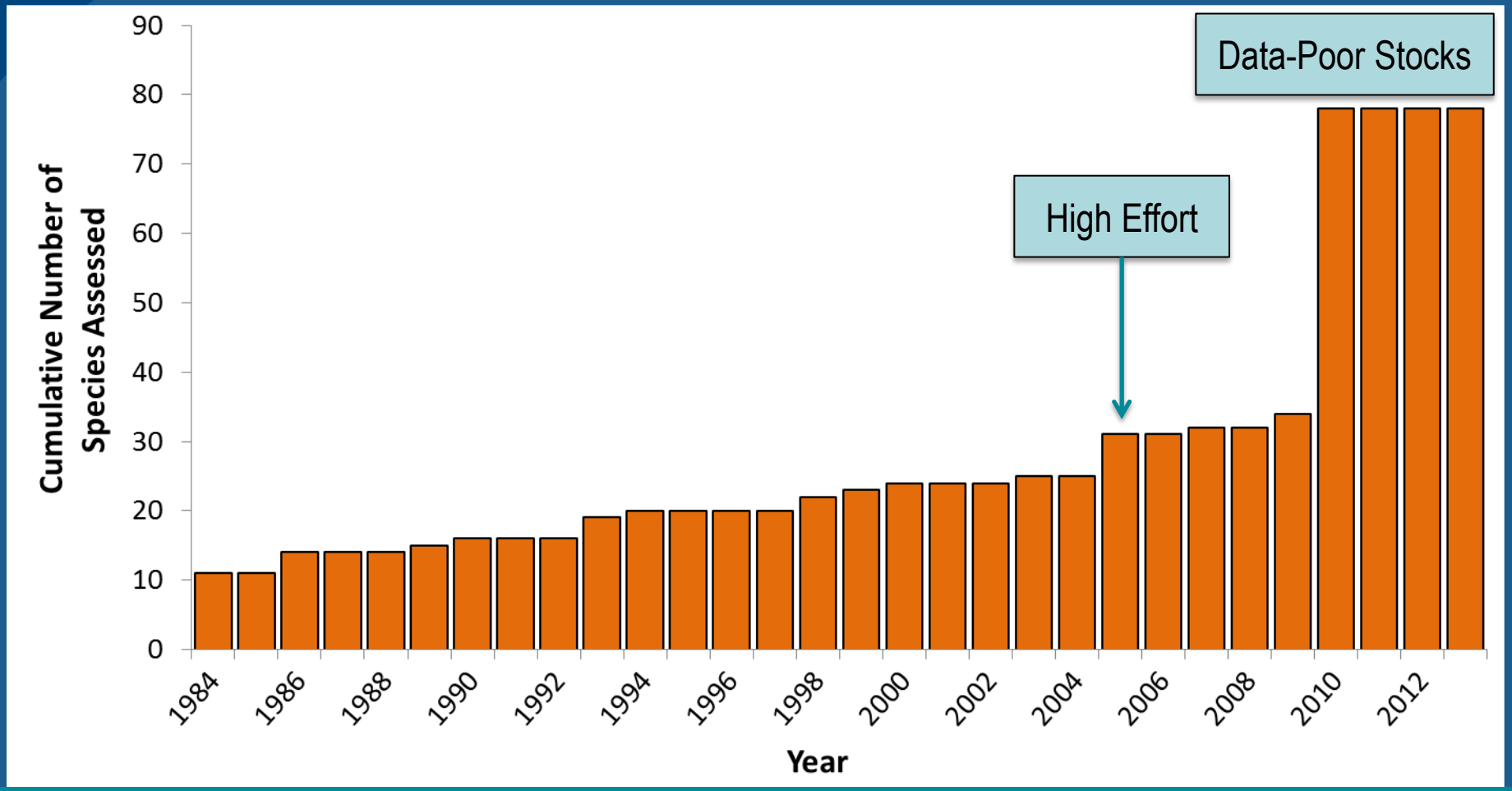
- MSA 2006 Reauthorization
  - National Standard 1
  - National Standard 2
- Species Information System (SIS)
- Fish Stock Sustainability Index (FSS)

MSA 2006 Reauthorization

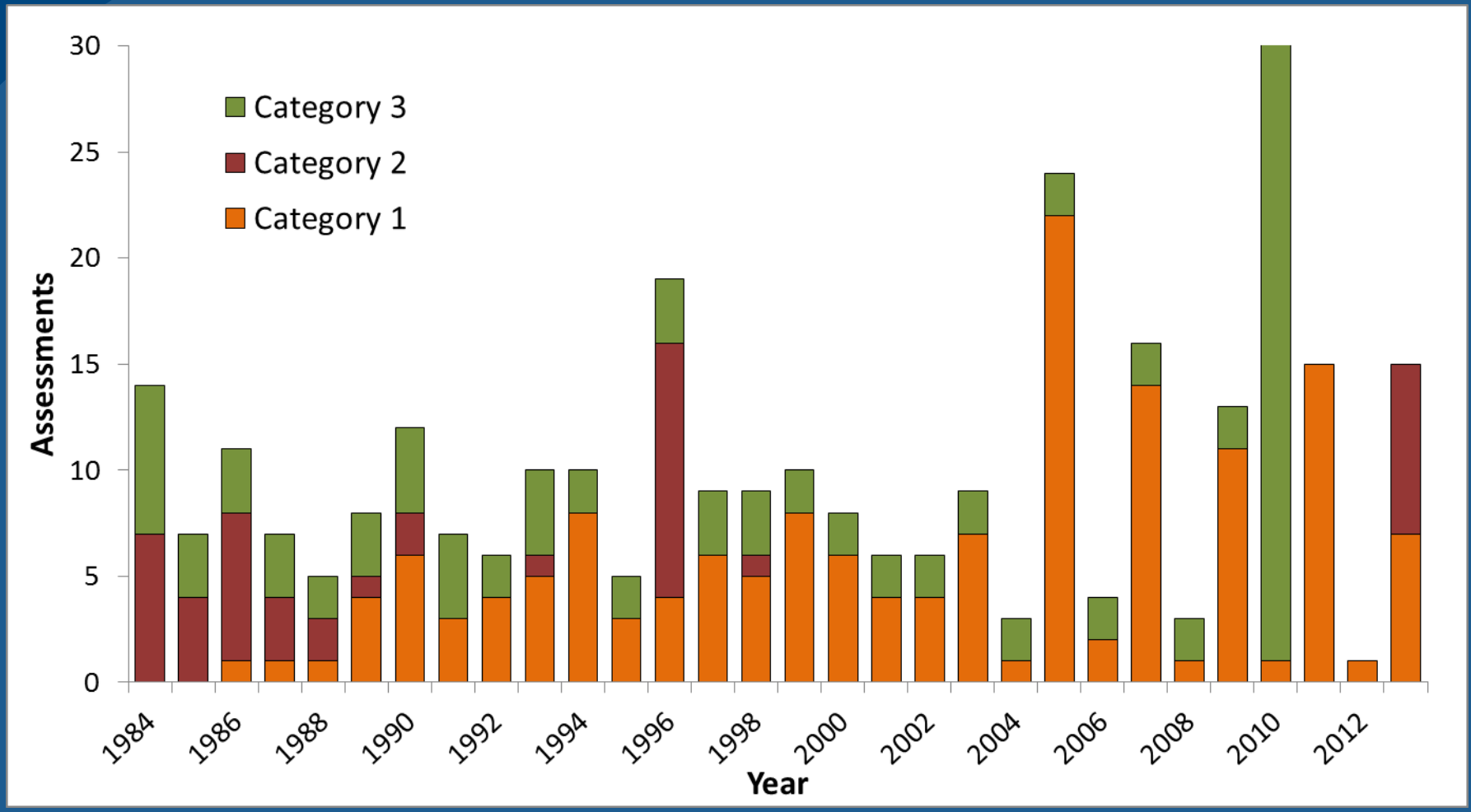
- Establish OFLs and ACLs that cover all stocks within the Fishery Management Plan (FMP) based on scientific information
- U.S. West Coast Groundfish FMP
  - 90+ species



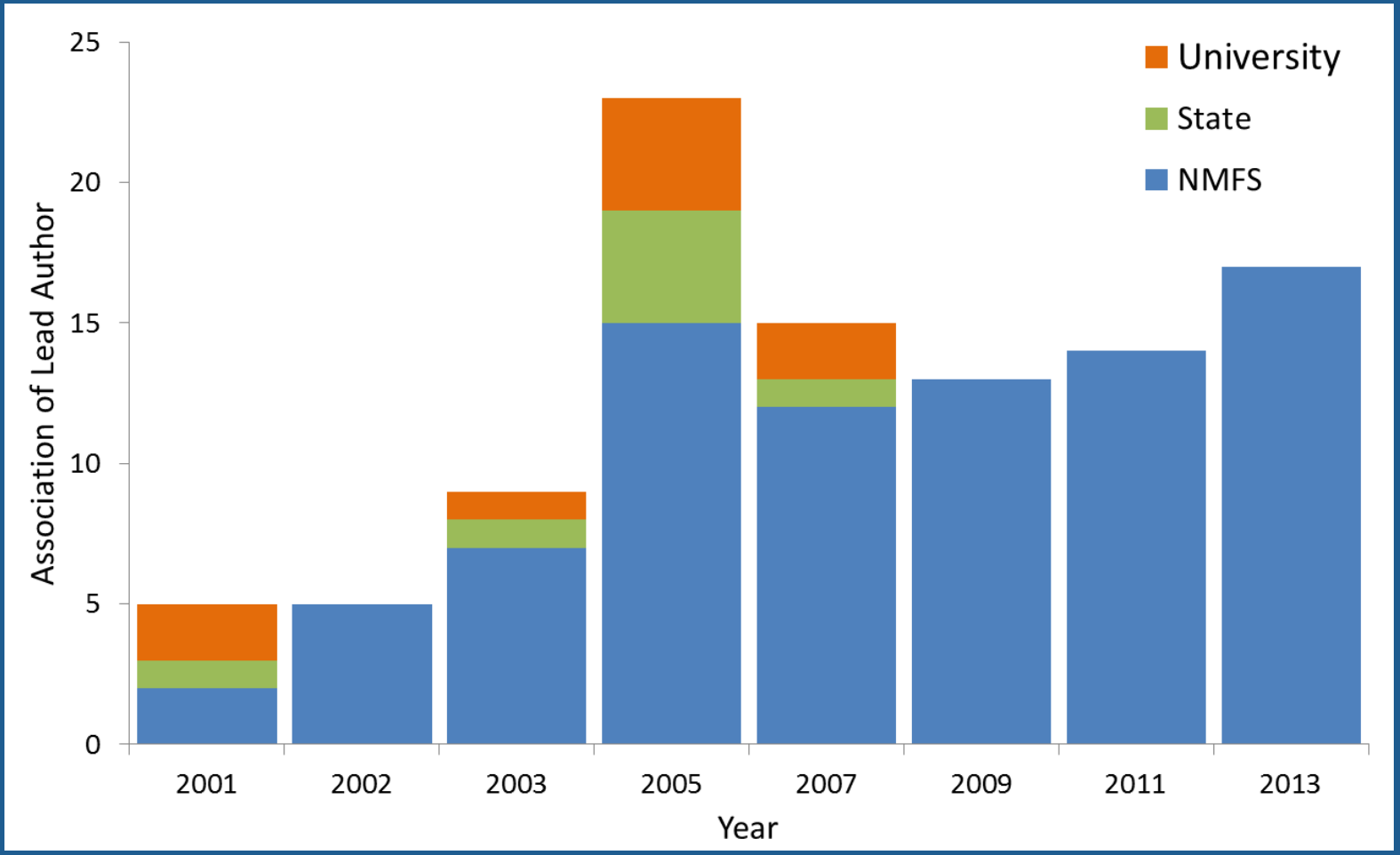
History of Assessment



Assessments by Year

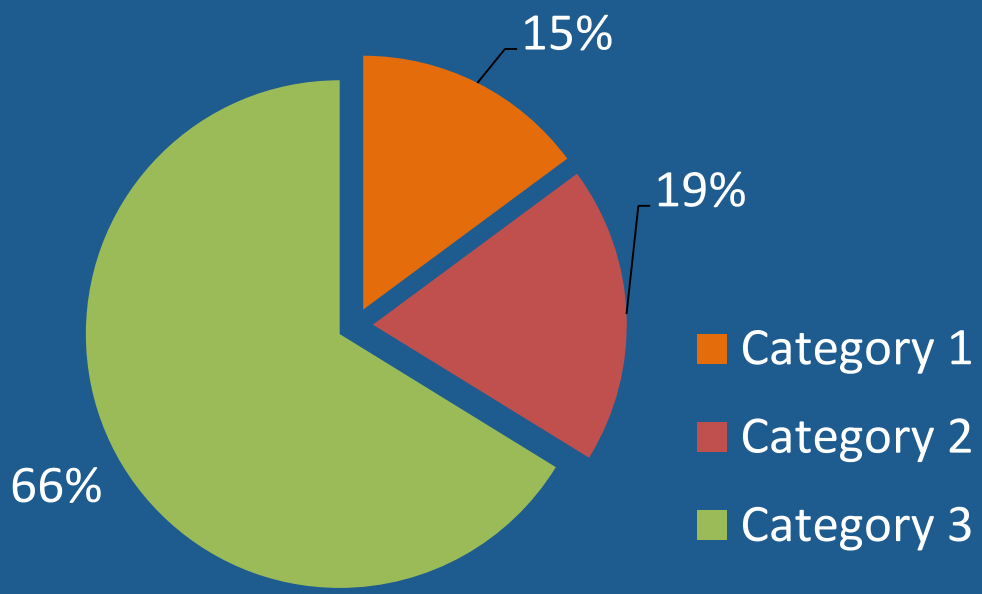


Assessment Leads



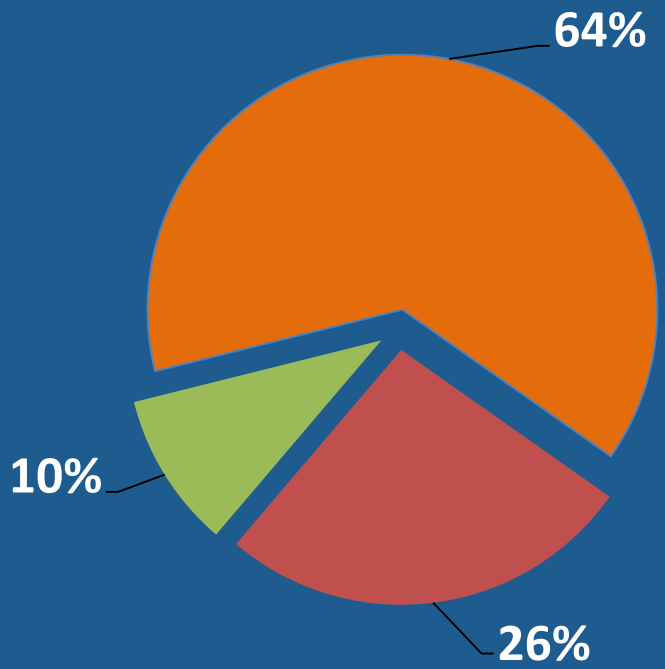
Assessment Units by Category

% in each Category



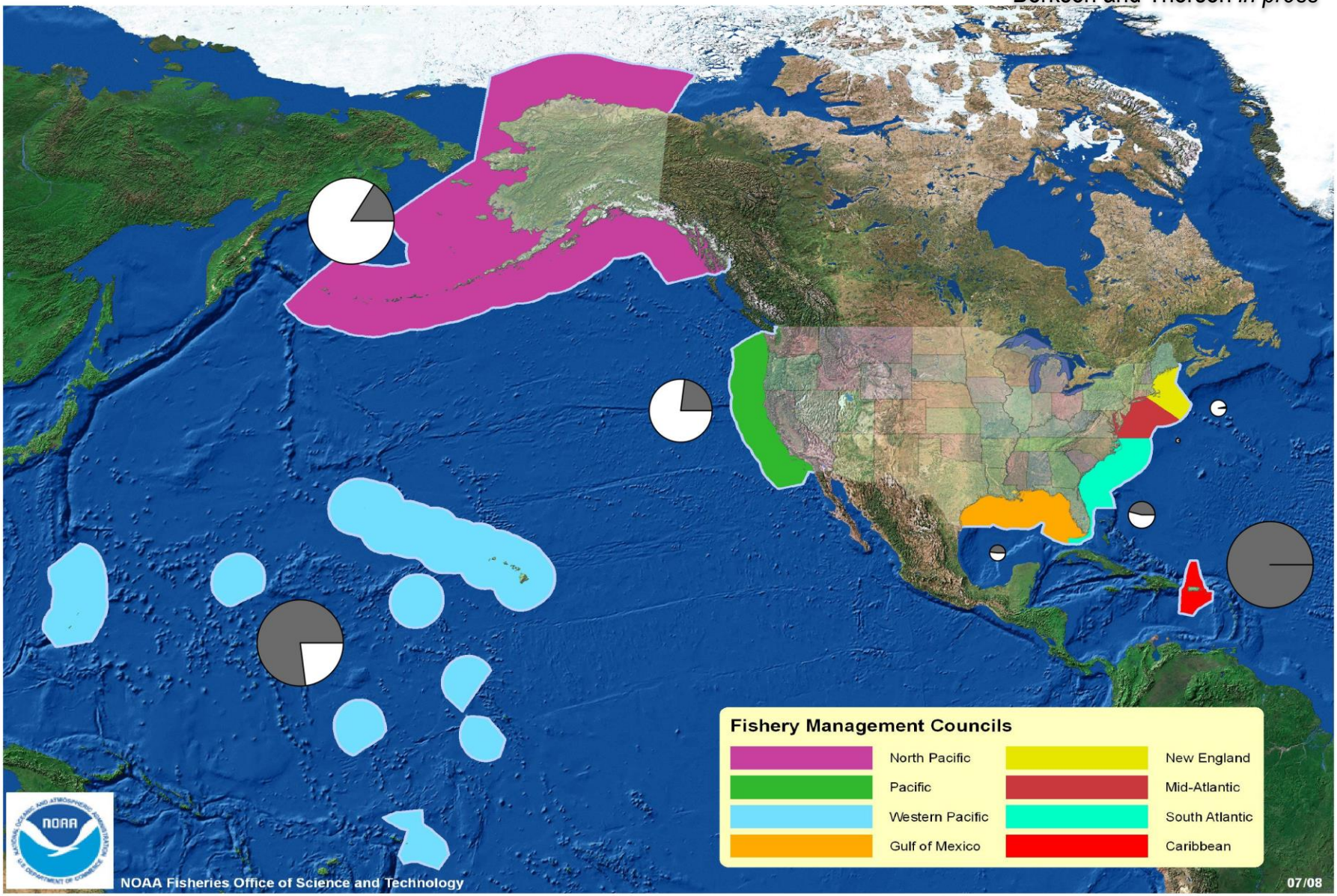
N = 148

% of ACL by Category



Total = 167,348 mt

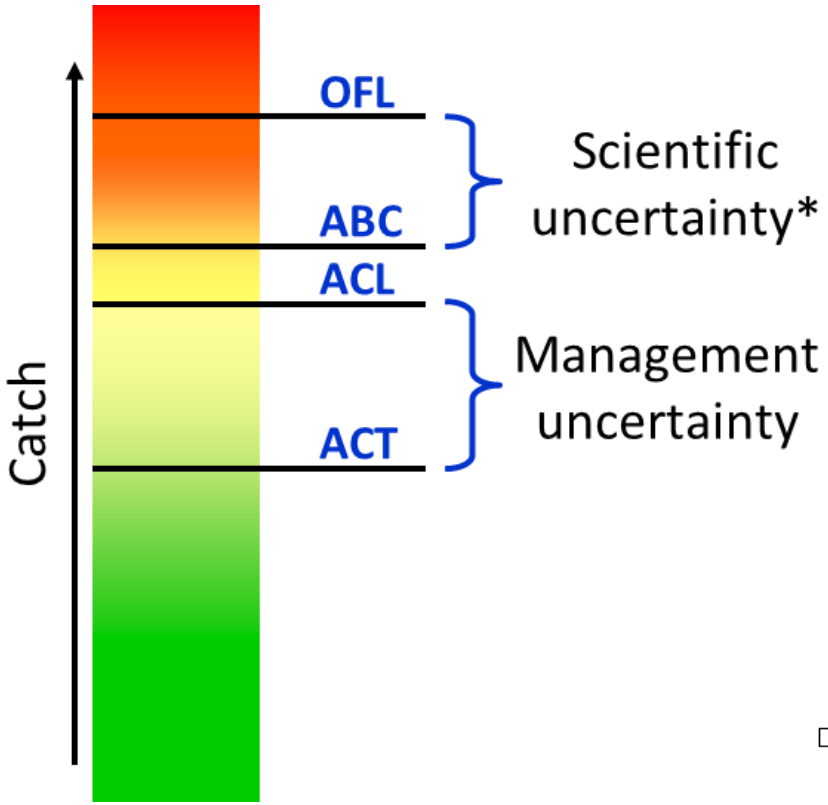
Berkson and Thorson *in press*

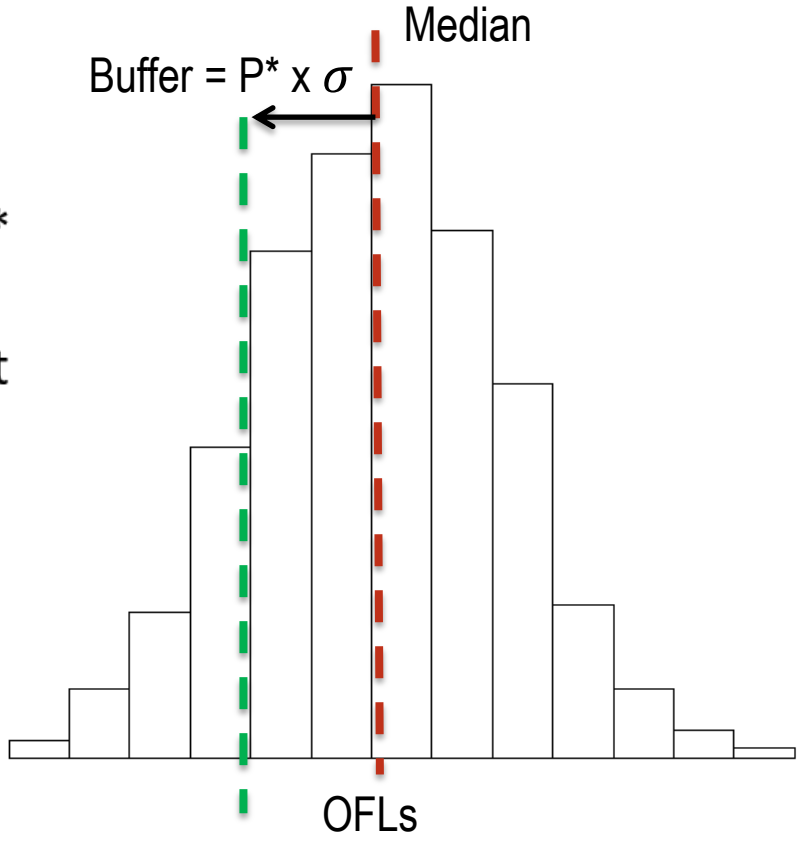


National Standard 1

- "Conservation and management measures shall prevent overfishing while achieving, on a continuing basis, the optimum yield…"

Accounting for uncertainty to prevent overfishing





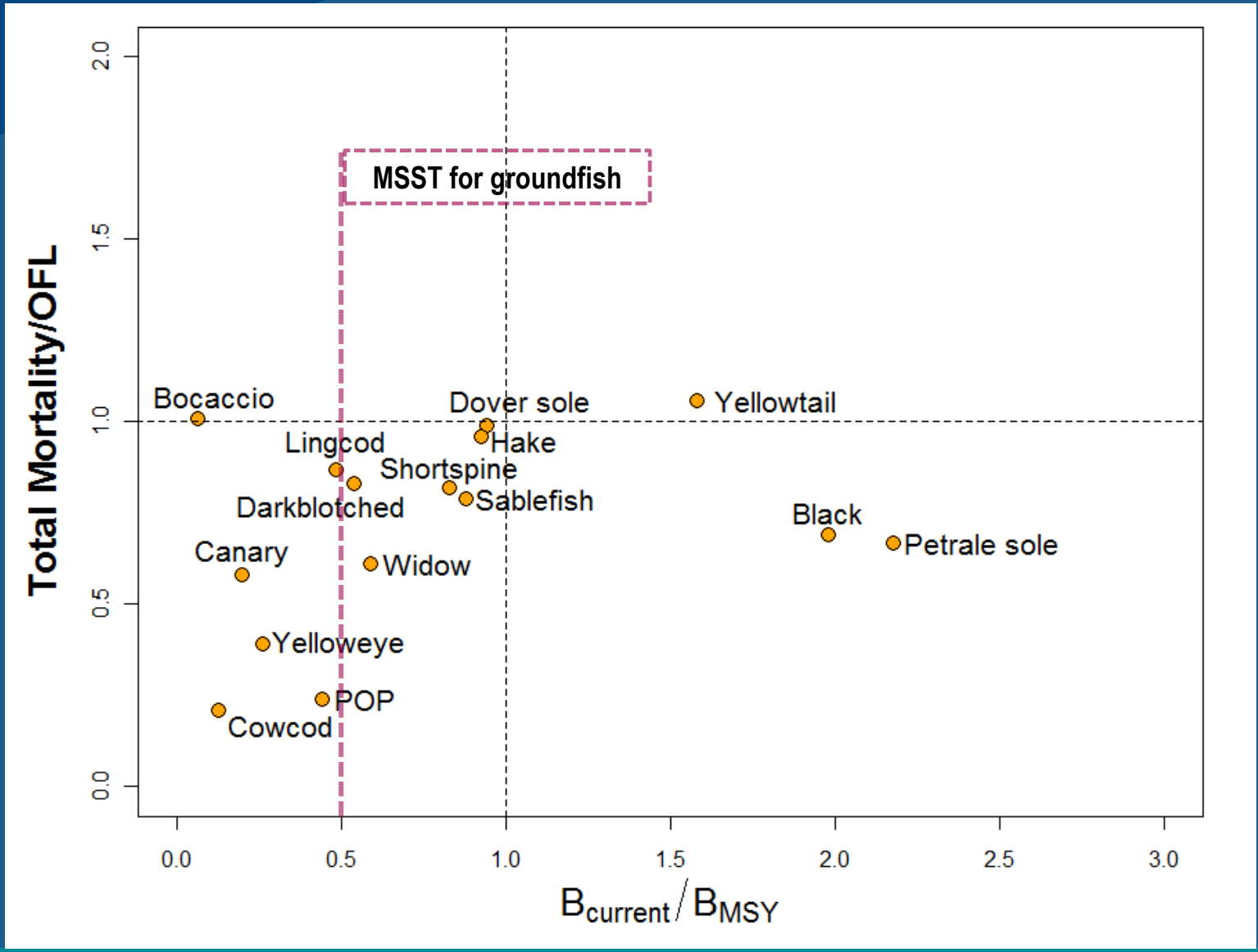
Award winning meta-analysis to determine sigma for category 1 stocks (Ralston et al. 2011)

End Overfishing & Rebuilding Stocks

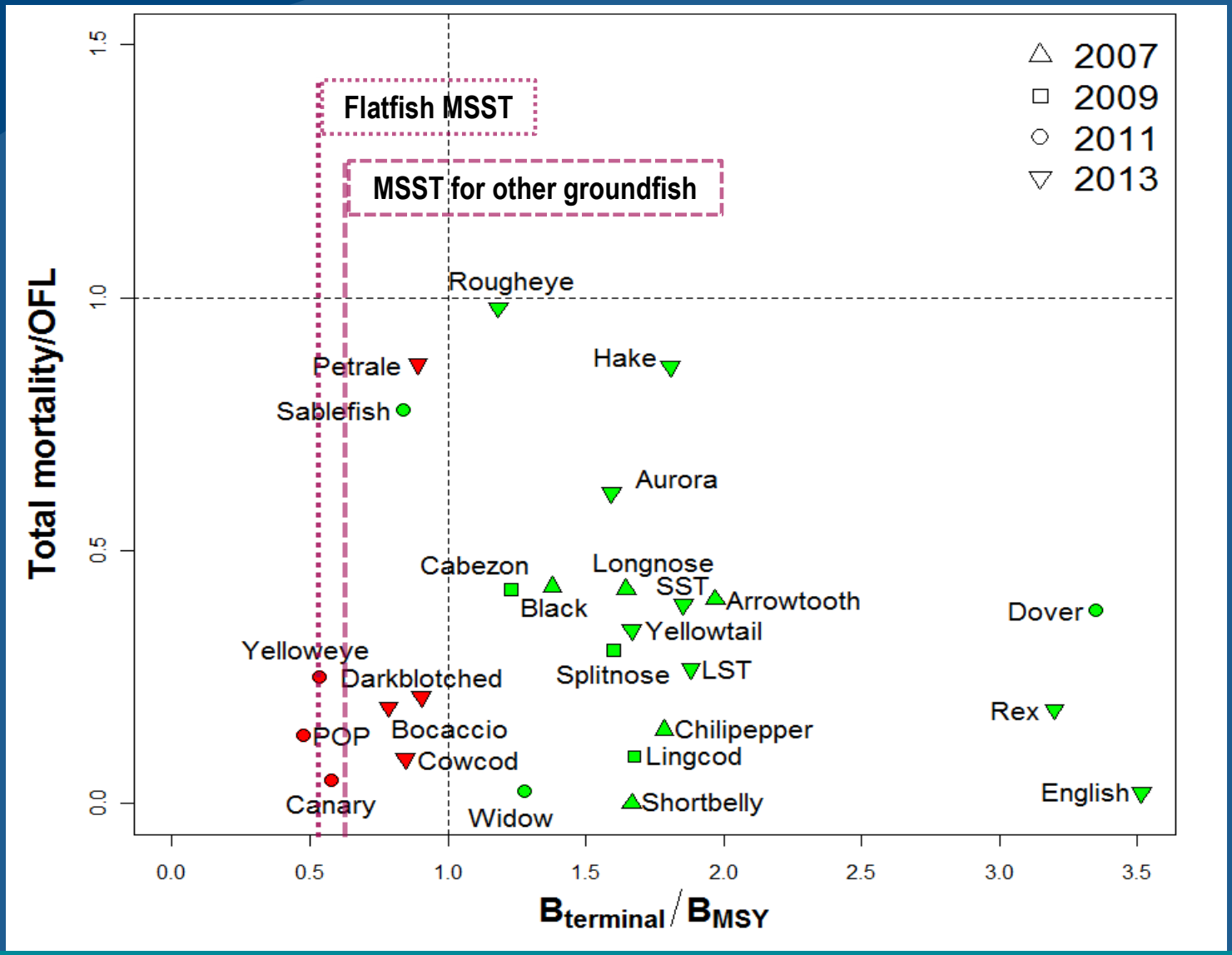
Overfished Stock	Year Declared	Year Rebuilt	Median Time to Rebuild
Bocaccio Rockfish	1999		2021
Pacific Ocean Perch	1999		2051
Lingcod	1999	2005	
Canary Rockfish	2000		2030
Cowcod Rockfish	2000		2019*
Darkblotched Rockfish	2000		2017
Widow Rockfish	2001	2011	
Yelloweye Rockfish	2002		2067
Pacific Hake	2002	2004	
Petrale Sole	2010		2013

*From last Cowcod Rockfish rebuilding plan. Updated analysis currently being conducted

State of the Stocks in 2001



State of the Stocks for 2007-2013



Rebuilding Strategies

- Management Strategy Evaluation of rebuilding revisions rules for overfished stocks
  - Punt and Ralston 2007
    - Rockfish only
  - Wetzel and Punt *in process*
    - Multiple life-history types

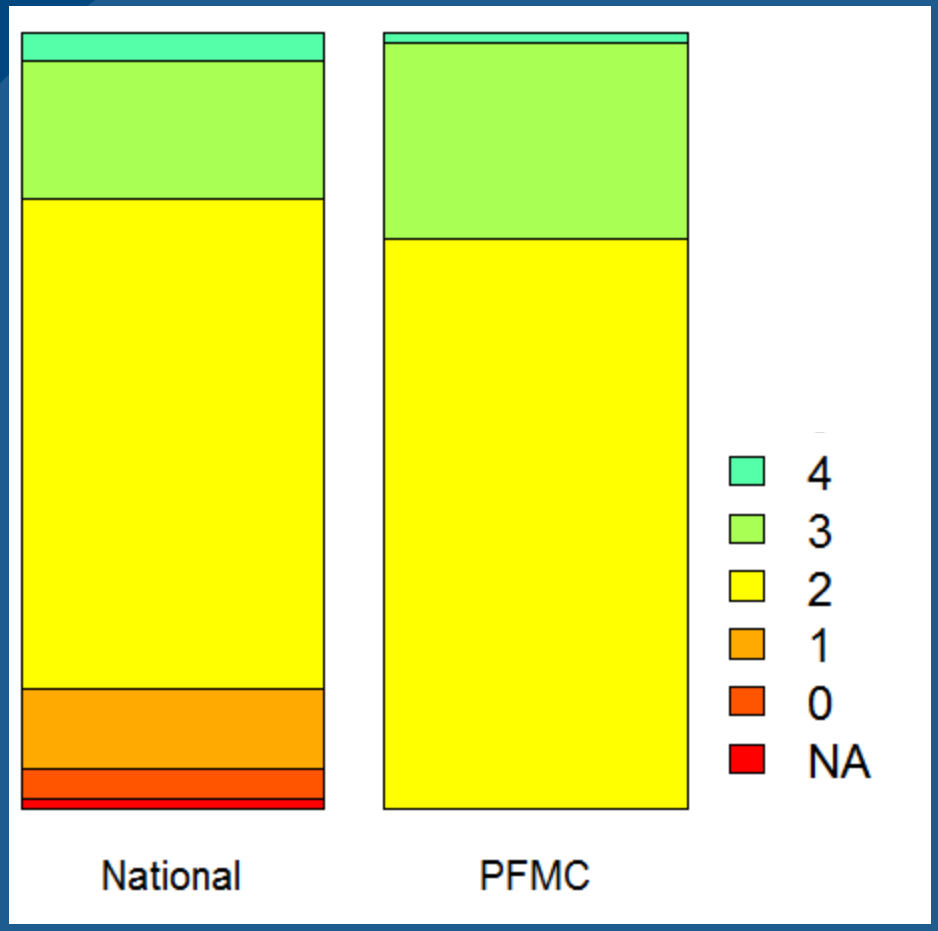
National Standard 2

- "Conservation and management measures shall be based upon the best scientific information available"
- Assessment Review process
  - STAR process with independent experts
  - SSC review and approval of assessment tools and techniques

Tracking Assessment Data "Quantity" and "Quality"

- Species Information System (SIS)
  - National Data that tracks attributes of assessments:
    - Data quality and quantity
    - Assessment frequency
    - Complexity of assessment model
  - Available online:
    - catalog.data.gov/dataset/species-information-system-sis

Life-History Data



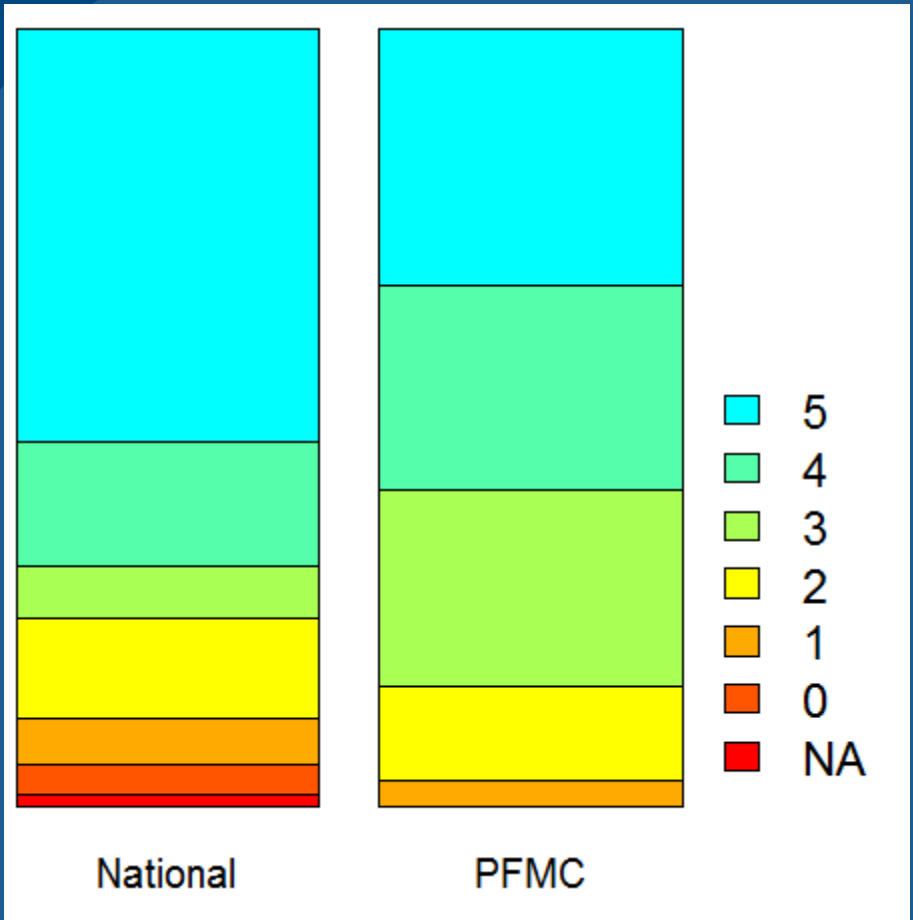
4. Food habits information defining predator-prey relationships

3. Season and spatial movement patterns

2. Basic demographic parameters (e.g. age, growth, natural mortality)

1. Size composition

Catch Data



5. Accurate and complete data on total removals (landed, discard, and bycatch)

4. Catch age compositions

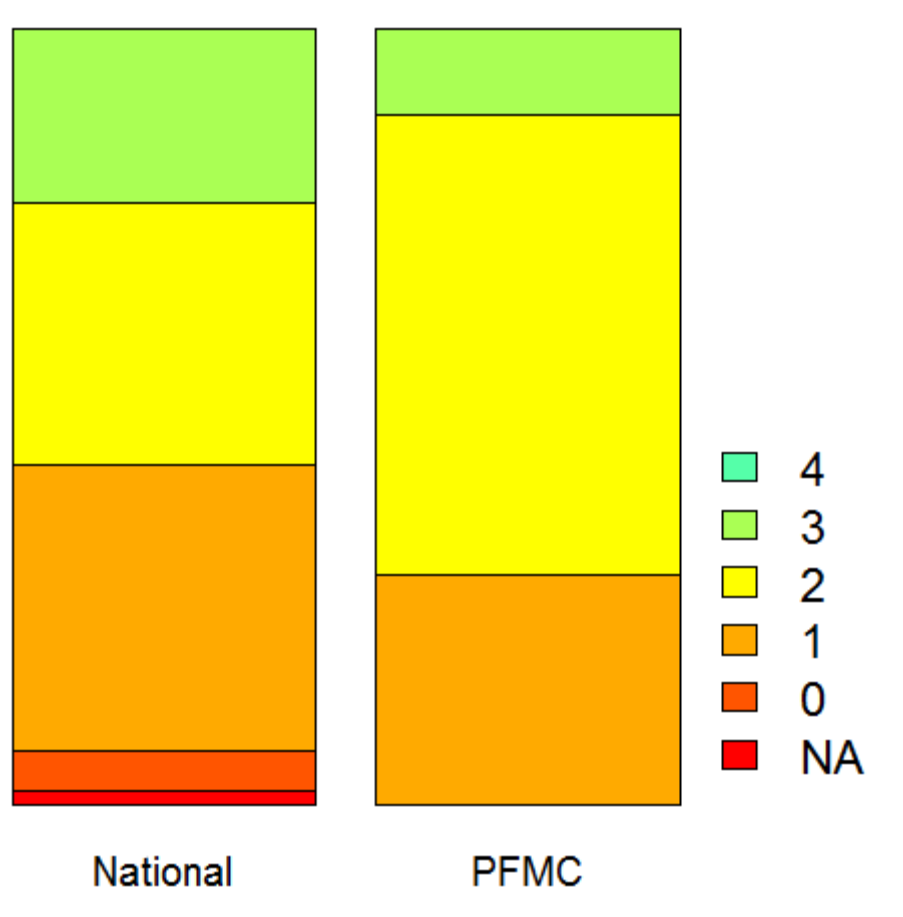
3. Spatial data on catch

2. Catch size composition

1. Landed catch provides a minimum estimate.

0. No Catch Data

Levels of Abundance Data



4. Habitat-specific surveys

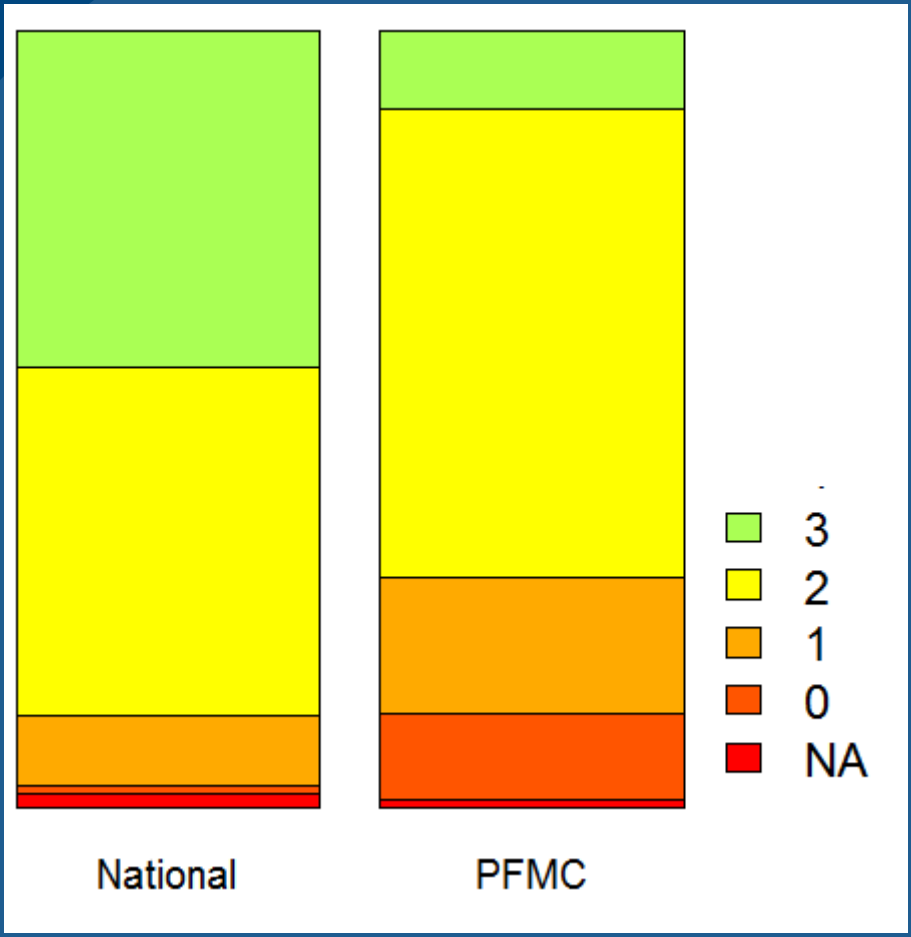
3. Research surveys with known or estimated catchability

2. Precise, frequent surveys with age composition

1. Relative abundance index from fishery CPUE

0. No abundance data

Stock Assessment Frequency



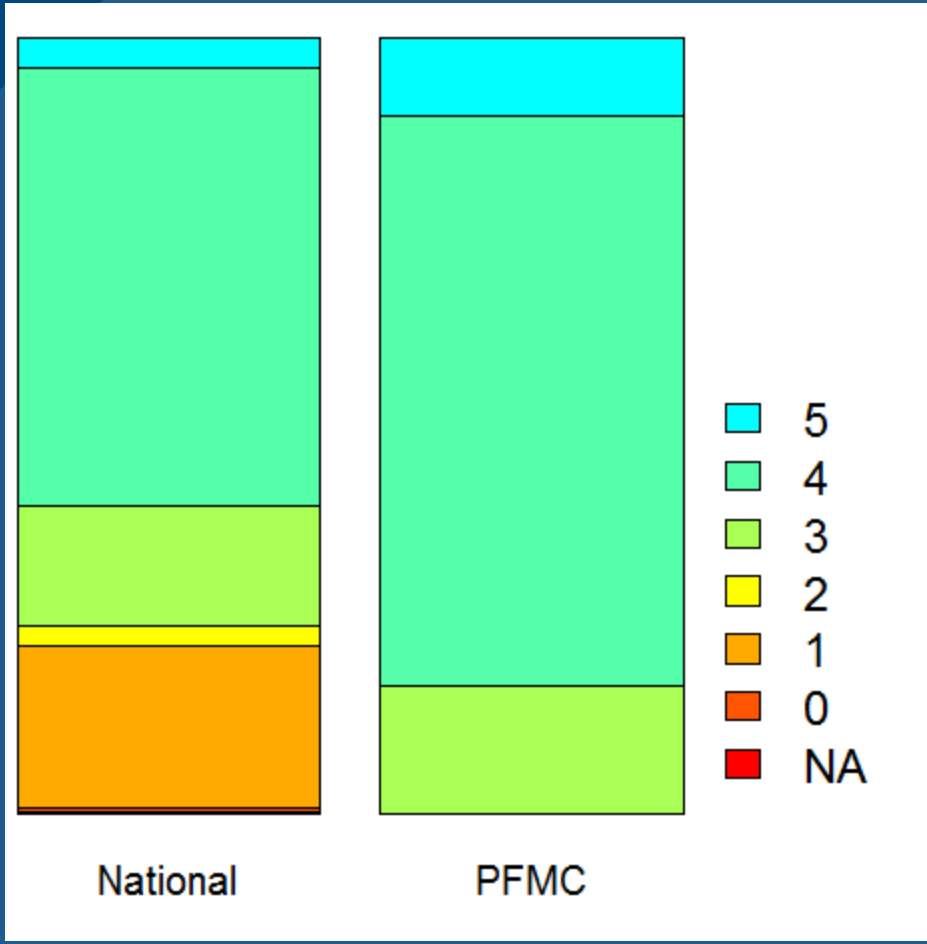
3. Annual or more: assessments are conducted at least annually

2. Frequent or recent: the most recent assessment was within 3 years

1. Infrequent: the most recent assessment was > 3 years ago

0. An assessment has never been conducted.

Levels of Stock Assessment Models



5. Model incorporates ecosystem data with time-varying parameters

4. Size, stage, or age-structured models

3. Equilibrium and non-equilibrium production modes

2. Simple equilibrium models

1. Time-series of an abundance index or one-time estimation of absolute abundance

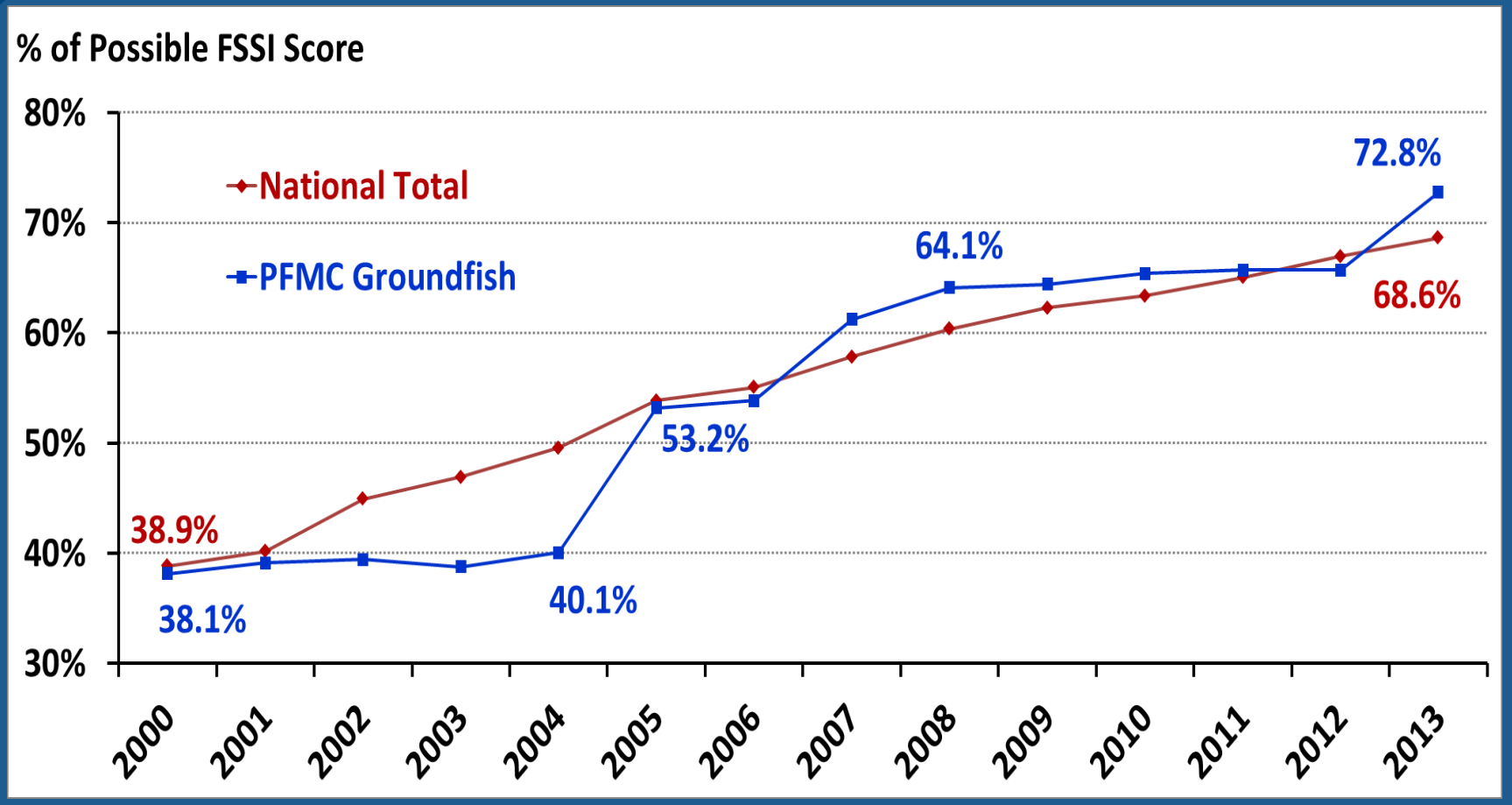
0. Simple time series plots or calculations of catch

Fish Stock Sustainability Index (FSSI)

- Calculated by assigning a score for each stock based on:

Status	Points Awarded
"Overfished" status is known	0.50
"Overfishing" status is known	0.50
Overfishing is not occurring (for stocks with know "overfishing" status)	1.0
Stock biomass is above the "overfished" level defined for the stock	1.0
Stock biomass is at or above 80% of the biomass that produces MSY 1.0	1.0

FSSI Scores Over Time



Conclusions

- Strengths:
  - Production of high quality assessments that receive thorough external review.
  - Range of stock assessment tools applied for assessment

- Challenges:
  - Limitation of resources (e.g. analysts, time/money of review)
  - Biennial cycle
  - Availability of data
    - Timing and quantity